Water Quality Study of Bays in Coastal Mississippi
Quality Assurance Project Plan

Project #05-0926

September 2005

Science and Ecosystem Support Division
United States Environmental Protection Agency – Region 4
Athens, GA 30605

Mississippi Department of Environmental Quality
2380 Highway 80 West
Jackson, Mississippi 39204

Title and Approval Sheet

Title: MS Sound/Embayment Water Quality Study

This quality assurance project plan (QAPP) has been prepared according to:
EPA Requirements for Quality Assurance Project Plans (EPA QA/R5 EPA/240/B-01/003, U.S. Environmental Protection Agency, Office of Environmental Information, Washington, DC, March 2001 (USEPA, 2001).

This document will be used to ensure that environmental and related data collected, compiled, and/or generated for this project are of the type, quantity, and quality required for their intended purposes within the limitations of available resources.

Approvals:

______________________________	______________
Mark Koenig Project Leader Ecological Assessment Branch	Date
______________________________	______________
Bill Cosgrove, Chief Ecological Evaluation Section Ecological Assessment Branch	Date
______________________________	______________
Marilyn Thornton, Chief Quality Assurance Section Management & Technical Services Branch	Date

Table of Contents

LIST OF TABLES

LIST OF FIGURES

1.0 Introduction

Hurricane Katrina struck the U.S. gulf coast on August 29, 2005. USGS real-time instruments in Gautier, MS recorded wind speeds as high as 140 miles per hour and rainfall of approximately 2 feet. In addition to structural/infrastructure destruction and loss of life, significant ecological and human health damage resulted from the storm. Several agencies including EPA, the Mississippi DEQ, USGS, USCOE, and FEMA have conducted extensive investigations into all aspects of the storm damage. Human health and water quality in the major bay systems in Mississippi and in Mississippi Sound are currently of particular concern to Mississippi DEQ and US EPA, Region 4.

The EPA Office of Research and Development has planned comprehensive water quality monitoring/sampling of the Mississippi Sound. To complement that effort, the Region 4 Science & Ecosystem Support Division has proposed conducting water quality monitoring and sampling at the major bay outlets to the Mississippi Sound. Additionally, Mississippi Department of Environmental Quality (MDEQ) has requested that this sampling include historic SESD/MDEQ sampling stations within each bay system to provide some relative comparison of current conditions.

2.0 Objectives

The primary objective of this survey is to provide water quality and flow data during a mid-ebb tide in each major bay system feeding Mississippi Sound to provide an estimate of both conventional and toxic pollutant loadings entering the Sound at the time of the study. In concert with this effort, in situ monitoring, water quality sampling, and sediment sampling will be conducted at selected stations within each bay or riverine system to provide an estimate of pollutant concentrations at the time of the study. The scope of this study has been determined by scientists and engineers with the MDEQ and EPA to provide preliminary data on these systems within a reasonable timeframe. The data quality objectives (DQOs) developed for this study are included in Appendix A.

The sampling locations selected to provide these estimates are based in whole or part on the hydrodynamic characteristics of the water bodies, the location of historic water quality sampling locations, and the general location of potential releases from industrial/municipal sources. The data generated from this study will provide - (1) a preliminary picture of the levels of targeted pollutants in the systems, and (2) information that will be useful to the State of Mississippi and EPA as additional studies are planned to assess water, sediment and/or fish/shellfish conditions in each of the four major bay systems included in the study.

3.0 Study Area

The study area encompasses four major bay systems on the Mississippi coast including Bay Casotte (including Bangs Lake), the Pascagoula/West Pascagoula River systems, the Back Bay of Biloxi, and Bay St. Louis, and the Pearl River, Figure 1. Figures 2-5 and Tables 1-2, show the proposed water column and sediment sampling locations within each major bay system.

Figure 1, Site Location Map - Gulf Coast Monitoring

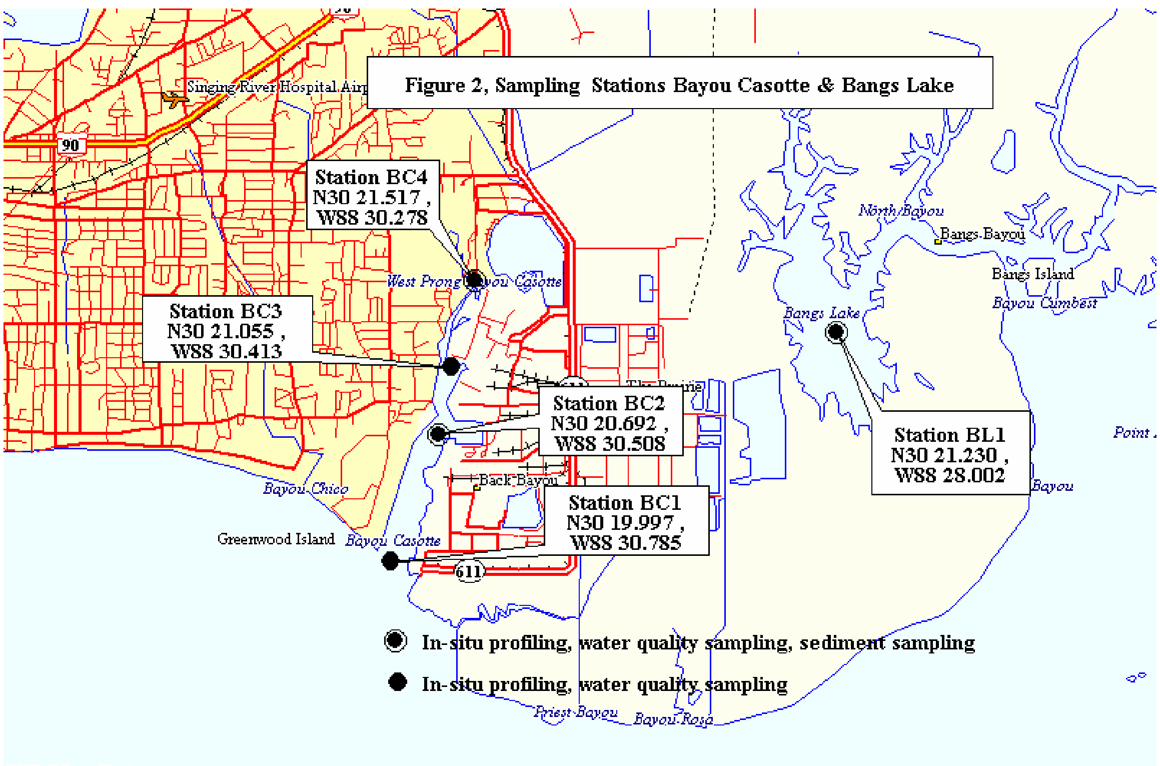


Figure 2, Sampling Stations Bayou Casotte & Bangs Lake

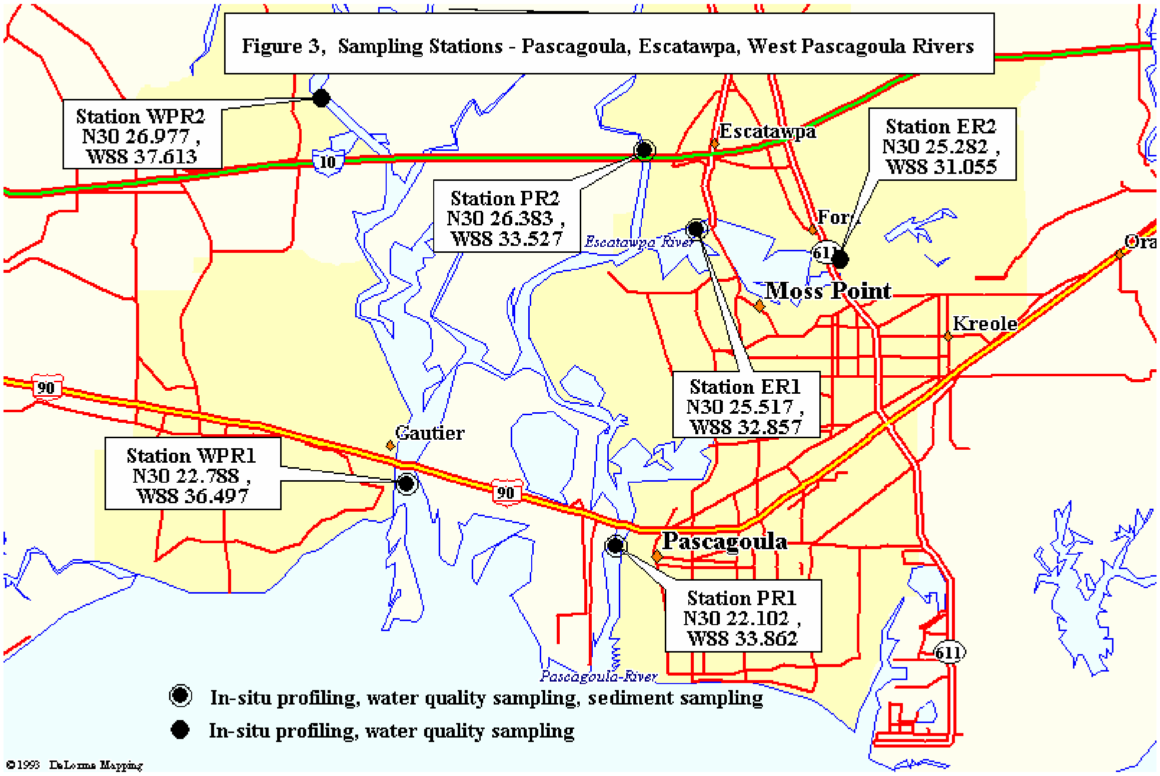
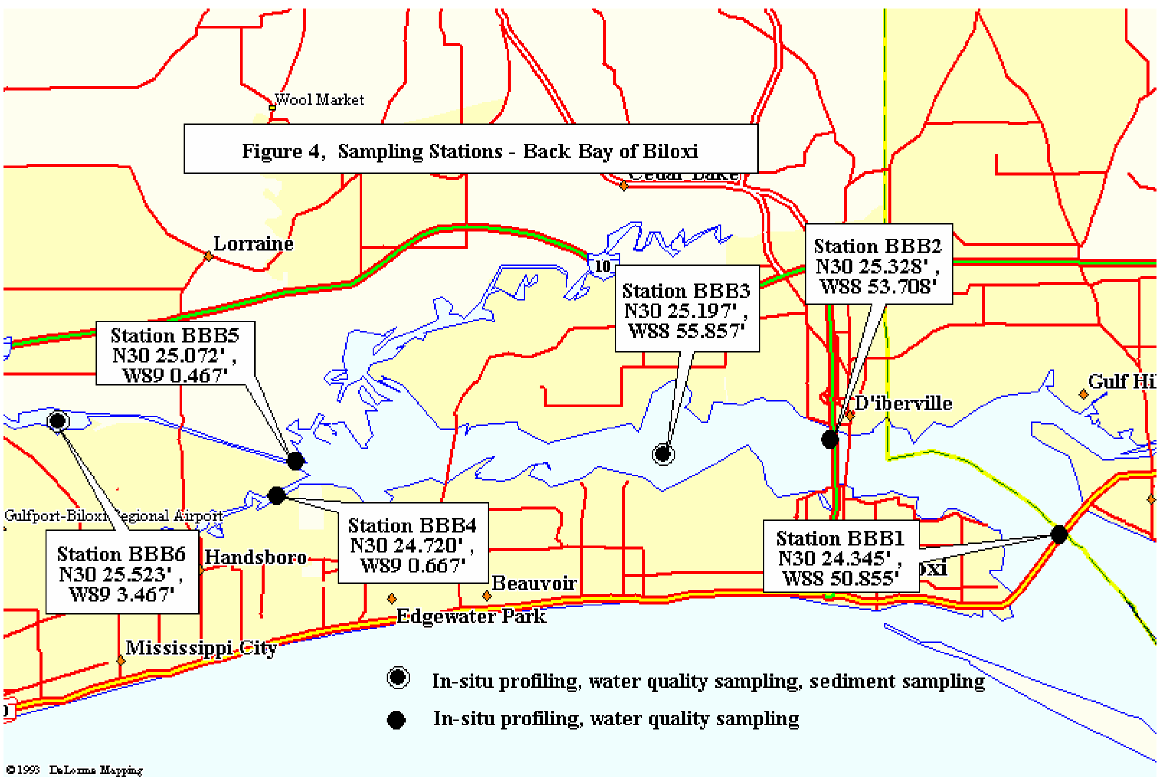


Figure 3, Sampling Stations - Pascagoula, Escatawpa, West Pascagoula Rivers
Station WPR2
N30 26.977 ,
W88 37.613
Station PR2
N30 26.383 ,
W88 33.527
Escatawpa
Station ER2
N30 25.282 ,
W88 31.055
Escatawpa River
Moss Point
Kreole
Station ER1
N30 25.517 ,
W88 32.857
Gautier
Station WPR1
N30 22.788 ,
W88 36.497
Pascagoula
Station PR1
N30 22.102 ,
W88 33.862
Pascagoula River
In-situ profiling, water quality sampling, sediment sampling
In-situ profiling, water quality sampling
©1993 DeLorme Mapping


Wool Market
Figure 4, Sampling Stations - Back Bay of Biloxi
Lorraine
Station BBB2
N30 25.328' ,
W88 53.708'
Station BBB3
N30 25.197' ,
W88 55.857'
Station BBB5
N30 25.072' ,
W89 0.467'
D'iberville
Gulfport-Biloxi Regional Airport
Station BBB6
N30 25.523' ,
W89 3.467'
Handsboro
Station BBB4
N30 24.720' ,
W89 0.667'
Beauvoir
Station BBB1
N30 24.345' ,
W88 50.855'
Edgewater Park
Mississippi City
In-situ profiling, water quality sampling, sediment sampling
In-situ profiling, water quality sampling
©1993 DeLorme Mapping

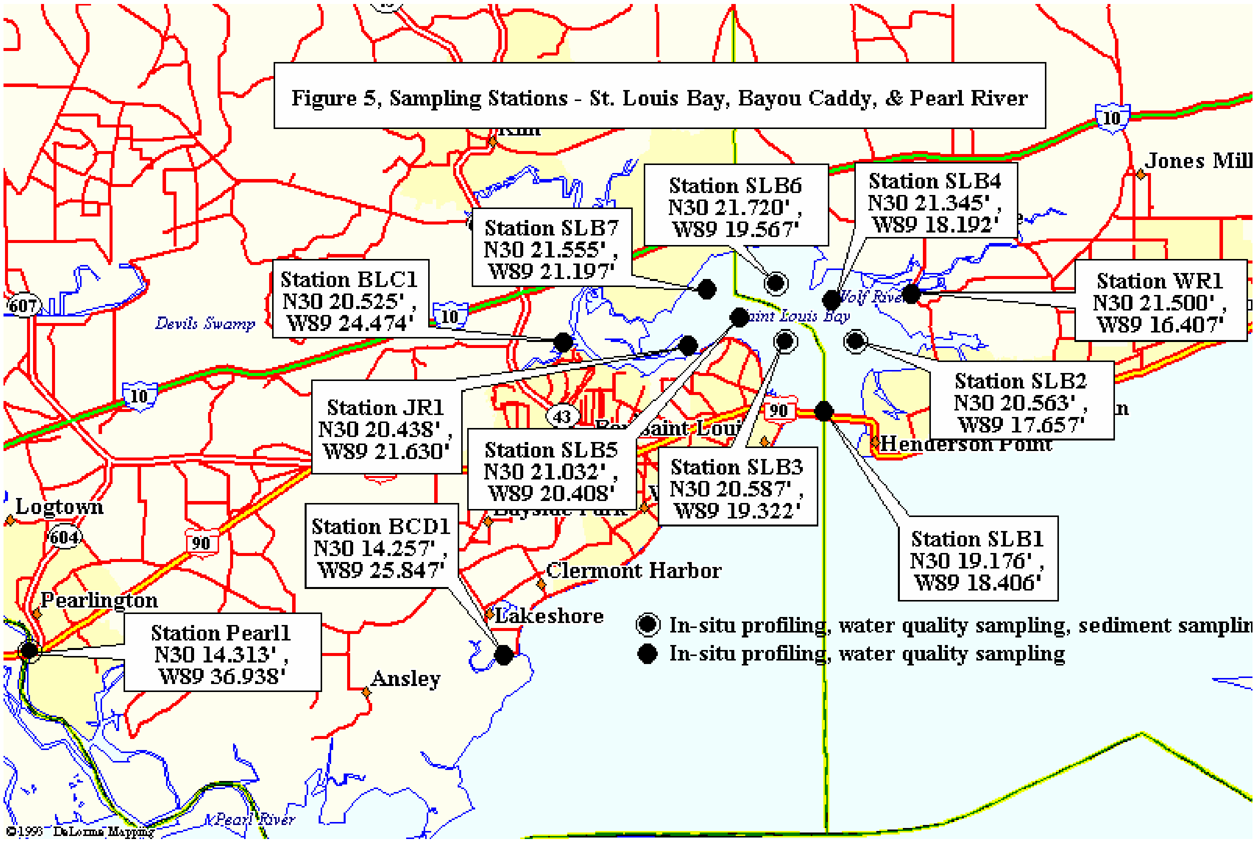


Table 1
Water Quality Sampling Stations and Collection Details

Station No.	TOC & Nutrients H2SO4 pH < 2 1 L plastic SESD -lab 05-0926	Metal Scan HNO3 pH<2 1 L plastic SESD-lab 05-0926	Routine Volatile Scan 40 ml glass SESD-lab 05-0926	Routine Semi- Volatile Scan 1 amber L glass SESD-lab 05-0926	Pesticide & PCB Scan 1 amber L glass SESD-lab 05-0926	AGPT 2 liter plastic SESD-lab 05-0926
BL1	1	1	3	2	2	
BC1	1	1	3	2	2	1
BCD1*	1	1	3	2	2	1
BC2	1	1	3	2	2	
BC3	1	1	3	2	2	
BC4	1	1	3	2	2	
PR1	1	1	3	2	2	1
PR2	1	1	3	2	2	
ER1	1	1	3	2	2	
ER2	1	1	3	2	2	

Table 1
Water Quality Sampling Stations and Collection Details

Station No.	TOC & Nutrients H2SO4 pH < 2 1 L plastic SESD -lab 05-0926	Metal Scan HNO3 pH<2 1 L plastic SESD-lab 05-0926	Routine Volatile Scan 40 ml glass SESD-lab 05-0926	Routine Semi- Volatile Scan 1 amber L glass SESD-lab 05-0926	Pesticide & PCB Scan 1 amber L glass SESD-lab 05-0926	AGPT 2 liter plastic SESD-lab 05-0926
WPR1	1	1	3	2	2	1
WPR2	1	1	3	2	2	
BBB1	1	1	3	2	2	1
BBBD1*	1	1	3	2	2	1
BBB2	1	1	3	2	2	
BBB3	1	1	3	4**	4**	
BBB4	1	1	3	2	2	
BBB5	1	1	3	2	2	
BBB6	1	1	3	2	2	
SLB1	1	1	3	2	2	1
SLBD1*	1	1	3	2	2	1
SLB2	1	1	3	2	2	
SLB3	1	1	3	2	2	
SLB4	1	1	3	2	2	
SLB5	1	1	3	2	2	
SLB6	1	1	3	2	2	
SLB7	1	1	3	2	2	
WR1	1	1	3	2	2	
JR1	1	1	3	2	2	
BLC1	1	1	3	4 **	4**	
BCD1	1	1	3	2	2	
Pearl1	1	1	3	2	2	1
QCPBS	1	1				
QCPBF	1	1				
QCRB1W	1	1		1	1	

Table 1 Water Quality Sampling Stations and Collection Details						
Station No.	**TOC & Nutrients** H2SO4 pH < 2 1 L plastic SESD -lab 05-0926	**Metal Scan** HNO3 pH<2 1 L plastic SESD-lab 05-0926	**Routine Volatile Scan** 40 ml glass SESD-lab 05-0926	**Routine Semi- Volatile Scan** 1 amber L glass SESD-lab 05-0926	**Pesticide & PCB Scan** 1 amber L glass SESD-lab 05-0926	**AGPT** 2 liter plastic SESD-lab 05-0926
QCRB1S	1	1		1	1	
QCRB2W	1	1		1	1	
QCRB2S	1	1		1	1	
QCRB3W	1	1		1	1	
QCRB3S	1	1		1	1	
QCTB1W			3			
QCTB1S			3			
QCTB2W			3			
QCTB2S			3			
QCTB3W			3			
QCTB3S			3			
29 Stations						

* Duplicate sample ** MS/MSD Analysis

Table 2 Sediment Sampling Stations and Collection Details				
Station No.	**TOC, Nutrients Metal Scan** 8 ounce glass SESD -lab 05-0926	**Routine Volatile Scan** Encore Sampler SESD- lab 05-0926	**Routine Semi- Volatile Scan Pesticide & PCB Scan** 8 ounce glass SESD-lab 05-0926	**Dioxin** 8 ounce glass Contract-lab
BL1	1	3	1	
BC2	1	3	1	
BC4	1	3	1	
PR1	1	3	1	1
PR2	1	3	1	1

Table 2 Sediment Sampling Stations and Collection Details				
Station No.	**TOC, Nutrients Metal Scan** 8 ounce glass SESD -lab 05-0926	**Routine Volatile Scan** Encore Sampler SESD- lab 05-0926	**Routine Semi- Volatile Scan Pesticide & PCB Scan** 8 ounce glass SESD-lab 05-0926	**Dioxin** 8 ounce glass Contract-lab
ER1	1	3	1	1
WPR1	1	3	1	
BBB3	1	3	1	
BBBD3	1	3	1	
BBB6	1	3	1	
SLB2	1	3	1	1
SLB3	1	3	1	
SLB6	1	3	1	1
PEARL1	1	3	1	
14 Stations				

* Duplicate sample

4.0 Methods

4.1 Water Quality Sampling

All surface water samples will be collected according to the procedures in the Ecological Assessment Standard Operation Procedures and Quality Assurance Manual, January 2002 (EASOPQAM) and the Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, November, 2001 (EISOPQAM). Water quality samples will be collected at each station shown on Table 1 and on Figures 2 – 5. Analyses of these samples will include Total Organic Carbon (TOC) and nutrients scan, metals scan, routine volatile scan, routine semi-volatile scan, and pesticide and PCB scan. Appendix B contains a series of tables that list individual analytes for each of these scans. All samples will be collected after the completion of the in-situ profiling at each station. If the station is stratified based on salinity, the collection will be a composite from the mid-depth point of each stratified layer. If stratification is present, VOA samples will be collected from the upper layer.

Table 3 shows the required sample containers, preservation, and holding times for these water quality samples. At one station a second semi-volatile sample will be collected to allow for matrix spike analyses for quality assurance purposes.

Following collection, samples will be preserved as described in Table 3 and placed in an iced cooler. Samples will be transported to an onsite command center for processing. Samples will be transported daily by MDEQ courier to the SESD laboratory in Athens, Georgia.

Table 3
Water Quality Sample Preservation Requirements

Analytical Group	Volume/Container	Preservative	Holding Time
TOC/nutrients	1 liter polyethylene	H_2SO_4 to pH < 2, Ice to 4^o C	28 days
Metals	1 liter polyethylene	HNO_3 to pH < 2, Ice to 4^o C	28 days
Volatiles	40 ml glass vials (3) with septum seal	Ice to 4^o C	7 days
Semi-volatiles	1 liter amber glass (2 bottles per station)	Ice to 4^o C	14 days
Pesticides/PCBs	1 liter amber glass (2 bottles per station)	Ice to 4^o C	14 days

4.2 Analytical Methods

All samples will be analyzed in accordance with the Analytical Support Branch Laboratory Operations and Quality Assurance Manual, dated November 17, 2005 which can be accessed at: http://www.epa.gov/region4/sesd/asbsop/asbsop.html . Refer to Appendix B for a list of analytes, methods and minimum quantitation limits (MQLs) that will be used for this study. It should be noted that MQLs are matrix dependent and may vary from sample to sample depending on background material and other analyte concentrations. The MQLs presented in these tables are those which can be achieved the majority of time in the matrix listed. ASBs Standard Operating Procedures (SOPs) for the listed methods include quality control procedures equal to or greater than the method specified levels.

4.3 In Situ Monitoring

In-situ monitoring will be conducted at all stations shown in Figures 2-5. Dissolved oxygen, salinity, pH and temperature (DST) profiles will be obtained using a multi-parameter water quality monitor manually deployed. All monitoring equipment will be calibrated in accordance with the EASOPQAM and the manufacturer's specifications daily and end checked at the end of each day. Data will be recorded in designated data books. Parameter measurements will be obtained from surface to bottom at one foot increments in waters up to 12 feet deep and at two foot increments in waters greater than 12 feet deep. In order to maintain consistency, measurements made at two foot increments should be taken at odd-numbered depths. The results from the profiling will be used to guide the water quality sampling effort (see section 4.1 for discussion of stratified conditions).

Exact profiling locations will be determined by Global Positioning System (GPS) instrumentation by the profiling crew in the field. The latitude/longitude, date and time of each profile will be recorded in the field data book. Table 4 shows the analytical methods to be used for the in-situ monitoring.

Table 4
Field Parameter Analytical Methods

In-situ and Field Parameters	Units	Analytical Method	Accuracy of Primary Equipment
Dissolved Oxygen	mg/l	Membrane-electrode	$\pm$ 0.2 mg/l (up to 20 mg/l)
Temperature	^{o}C	Thermistor	$\pm$ 0.15 ^{o}C
Salinity	ppt	Conductivity probe	greater of $\pm$ 1% of reading or 0.1 ppt
pH	SU	pH electrode	$\pm$ 0.2 SU
Latitude/Longitude	decimal degrees	DGPS/GPS based on NAD83	$\pm$ 10 m (w/ selective availability disabled)

4.4 Sediment Sampling

Sediment samples will be collected at the stations shown in Table 2 and Figures 2-5 according to the procedures in the Ecological Assessment Standard Operation Procedures and Quality Assurance Manual, January 2002 (EASOPQAM) and the Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, November, 2001 (EISOPQAM). Sediment samples will be collected using a Petite Ponar dredge, then transferred into a Pyrex pan for homogenization and distribution using stainless steel spoon into the appropriate samples container (Table 5). Samples for VOA analysis will be collected immediately upon retrieval of the dredge using an Encore device. SESD lab analyses of these samples will include nutrient series scan, metals scan, routine semi-volatiles scan, and pesticide & PCB scan. A contract laboratory will analyze the sediment samples selected for dioxin. The specific analytes included in these scans are included in Appendix B. Samples will be transported daily by MDEQ or EPA couriers to the SESD laboratory in Athens, Georgia.

Table 5
Sediment Sample Preservation Requirements

Analytical Group	Volume/Container	Preservative	Holding Time
Nutrients	8 oz. glass	Ice to 4^{o} C	Not specified
Metals	8 oz. glass	Ice to 4^{o} C	6 mos.
Volatiles	5 g in 40 ml glass vials	Ice to 4^{o} C	48 hours

	(3) with 5 ml water + 2 oz. glass for % moisture		
Semi-volatiles	8 oz. glass	Ice to 4^{o} C	54 days
Pesticides/PCBs	8 oz. glass	Ice to 4^{o} C	54 days
Dioxin	8 oz. Glass	Ice to 4^{o} C	54 days

Multiple dredges will be utilized to minimize the need to decontaminate sampling equipment between stations. As required between stations and at the end of each sampling day, sampling equipment will be decontaminated in the field according to the procedures in the Ecological Assessment Standard Operation Procedures and Quality Assurance Manual, January 2002 (EASOPQAM).

4.5 Bay Outlet Loading to MS Sound

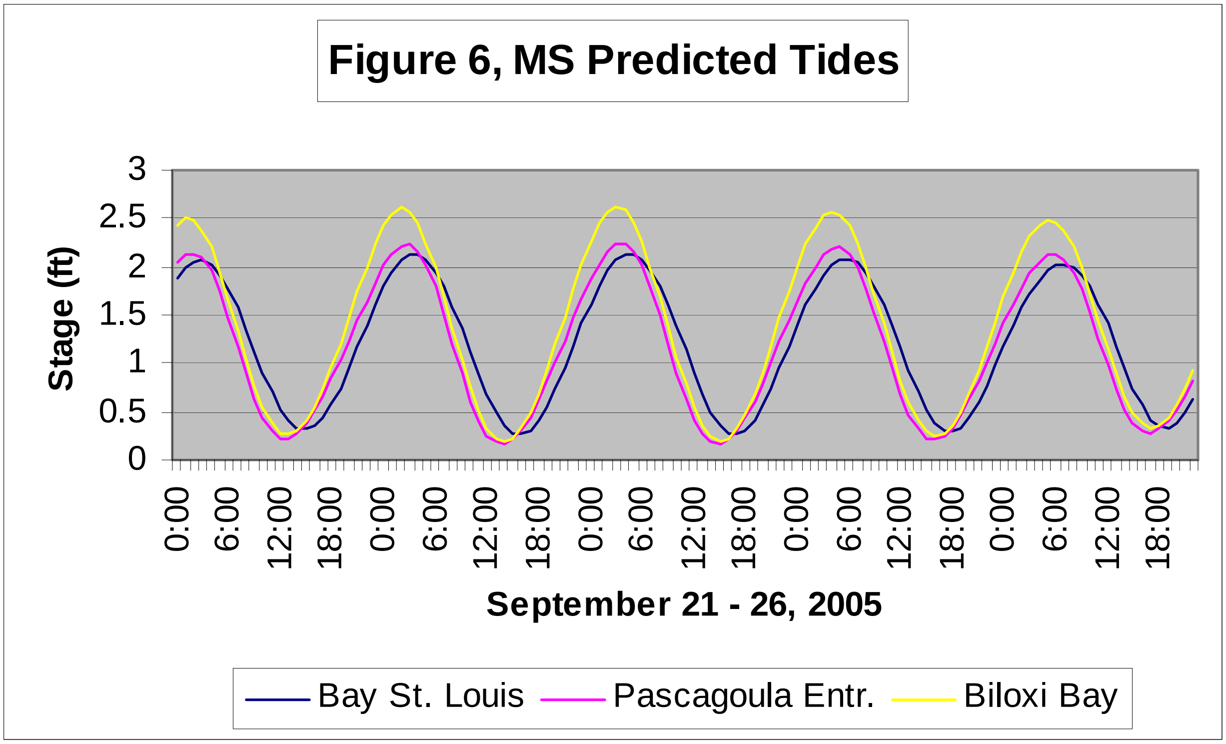
In order to estimate pollutant loadings entering Mississippi Sound at the time of the study, tidal flow measurement and water quality sampling will be conducted at each major bay outlet during a mid-ebb tide. As shown on Figures 2-5, major bay outlets include Bayou Casotte, Pascagoula River, West Pascagoula River, Bay St. Louis, Back Bay of Biloxi, and the Pearl River in Louisiana.

Flow will be measured in the cross-section via boat-mounted RD Instruments Rio Grande Acoustic Doppler Current Profiler (ADCP). The ADCP will be towed by boat across the measurement transect acquiring depth, width, and velocity. The resulting data will be fed in real time to a laptop computer for flow calculation using the manufacturer's software. The meter is factory calibrated and has a sensitivity of 0.003 fps

Due to the tidal nature of the water bodies to be sampled, flow is expected to vary during the sampling period. Therefore, three to four measurements will be made during the sampling effort to provide an average flow condition. In the event that debris or obstructions prevent floating the outlet cross-section, the flow measurement crew will seek an acceptable cross-section upstream of the outlet. If no acceptable cross section is found, an effort will made to estimate flow from quarter point velocity measurements using a tethered AA Price-type current meter.

Concurrent with flow measurement, water quality samples will be collected and analyzed as described in Section 4.1. These samples will be collected at quarter-points along the channel cross-section and composited to provide a single representative pollutant concentration for each analyte. In addition, a grab sample for Algal Growth Potential Test (AGPT) analysis will be collected in a 2 liter plastic bottle. The sample will be immediately placed on ice, and then transferred to a freezer upon arrival at the command post.

In order to determine mid-ebb tide, a Stevens Model F paper chart stage recorder will be installed in the Back Bay of Biloxi. The paper chart type recorder will allow field crews to quickly ascertain tide stage conditions. A chart of the predictive tides is provided to guide the flow measurement crew, Figure 6. In addition, a Stevens Axsys water level recorder will be installed at the same location to provide an electronic record of stage and to serve as a backup to the Model F.



5.0 Data Management

The Science and Ecosystem Support Division (SESD), Analytical Support Branch (ASB) will perform data review and data verification. **Data review** is the in-house examination to ensure that the data have been recorded, transmitted, and processed correctly. ASB's data review procedures include review by the analyst generating the data (primary analyst), a second review by an analyst (secondary analysts) who was not directly responsible for performing the analysis. A final review is performed by the organic or inorganic supervisor prior to reporting the data. ASB's detailed data review procedures are covered in Section 5.5.7.7 of ASB's Quality Assurance Manual[a]. Any departures from QAPP, method and/or SOP specifications will be noted in a narrative report sent to the data user/decision maker who will then evaluate the departures as to the overall effects on the project objectives. Limitations on the use of the data as a result of the data validation process will be addressed in the project report.

5.1 Documentation and Records

Field log books will be maintained according to the procedures in the Ecological Assessment Standard Operation Procedures and Quality Assurance Manual, January 2002 (EASOPQAM) by each sampling team for the duration of the field survey. Following completion of the field surveys, the log books will be maintained in the project file by the project leader. Upon completion of the final report, the log books and associated project records will be stored in the SESD Records Center.

The final data report will include processed data for each study module. Data processing will include such activities as rate calculation, preparation of data results tables/graphs, and data interpretation. The text of the report will describe the study collection effort and findings for each module and will include any problems encountered or other noteworthy information. Field data logs will not be included in the final report, but will be maintained with the project file in the SESD records room.

Copies of the final report will be provided to MS DEQ and EPA Region 4 Water Management Division – Geographic Planning and Technical Support Section. A copy of the final report will also be maintained in the SESD Records Center.

5.2 Quality Assurance and Quality Control

Quality control procedures will be used in the field and laboratory to ensure that reliable data are obtained. The following quality control samples will be utilized during the study to assess the sampling procedures used during field operations:

1) VOA trip blanks will be utilized to determine if VOA samples were contaminated during storage or transport while in the field. The trip blanks will be prepared in the laboratory prior to the sampling event. The trip blanks will consist of three 40 mL VOA vials. One trip blank will be included with each shipment of VOA samples.

2) Equipment rinse blanks will be utilized to assess the adequacy of field decontamination procedures. The only equipment that will be decontaminated while in the field is the petite ponars which will be used to collected sediment samples. One equipment rinse blank will be collected each day that decontamination of equipment occurs. The equipment rinse blank will be collected by capturing analyted-free which has been poured over/through the sampling equipment. The equipment rinse blank will be analyzed for the same suite of parameters as the sediment samples.

3) Post study preservative blanks will be collected to determine if contamination of preservatives occurred during the sampling event. One preservative blank will be collected for each bottle of preservative used during the sampling event. One liter polyethylene bottles filled with analyte-free water are provided by the laboratory prior to the sampling event. At the completion of the sampling event, the preservative blanks are prepared by preserving the bottles provided by the laboratory. The preservative blanks are analyzed for the appropriate analytes based on the preservative used.

4) Duplicate samples will be collected at selected surface water and sediment sampling locations as outlined in Tables 1 and 2 to provide an initial estimate of pollutant variability in the water column and sediments.

The project leader will be responsible for all corrective actions that may become necessary during the field investigation. No special training is required for the tasks that will be performed during this sampling investigation.

5.3 Data Validation/Verification

Data verification is the process for evaluating the completeness, correctness, and conformance/compliance of a specific data set against the method, procedural, or contractual specifications. ASB's analytical data is verified by the primary and/or secondary analyst against (1) the procedural and quality assurance (QA) requirements of the analytical method(s) which is(are) utilized, and (2) the ASB internal standard operating procedure for the method(s) which is(are) utilized. Any data which does not meet the method or QC requirements will either be re-analyzed, or qualified to denote that method or QC criteria were not met during the analysis. ASB's data verification procedures are described in detail in Sections 5.7 – 5.10 of ASB's Quality Assurance Manual (Footnote 1).

Data validation is an analyte- and sample-specific process that extends the evaluation of data beyond method, procedure, or contractual compliance (i.e., data verification) to determine the quality of a specific data set relative to the end use. It focuses on the project's specifications or needs, designed to meet the needs of the decision makers/data users and should note potentially unacceptable departures from the QA Project Plan. The data validation for this project will be performed by Region 4 SESD Quality Assurance Section (QAS) with assistance from the Environmental Services Assistance Team (ESAT) data validators. Both QAS and ESAT personnel are independent of the data generation process. In order to perform the data review QAS/ESAT personnel will be provided with copies of data packages generated during the analytical process. The data packages will include, but not necessarily be limited to, items such as chain of custody reports, instrument calibration curves, instrument raw data, sample preparation records, and quality control information. QAS/ESAT staff will validate project data against (1) the data quality objectives and specifications described in this QAPP, (2) method requirements, and (3) ASB SOPs.

Any departures from QAPP, method and/or SOP specifications will be noted in a narrative report sent to the data user/decision maker who will then evaluate the departures as to the overall effects on the project objectives. Limitations on the use of the data as a result of the data validation process will be addressed in the project report. All study data will be reported; however, data not within EAB tolerances will be flagged. Recorded data will be transcribed to electronic spreadsheet format for EAB analysis. A summary of resulting pollutant loadings will be provided in the final study report.

6.0 Project Management

Data collection will be managed through the Ecological Assessment Branch with guidance from the Mississippi Department of Environmental Protection Division and Region 4 Water Management Division. The project leader for EAB is Mark Koenig. Technical direction from MDEQ will be provided by Henry Folmar. Technical direction from EPA WMD will be provided by Andrew Bartlett, Chief of the Standards, Monitoring and TMDL Branch.

7.0 Project Schedule

Field work for this project is scheduled for the period of Thursday, September 22, 2005 through Tuesday, September 27, 2005. Each geographic area (Figures 1-4) will be sampled on separate days beginning with Bayou Casotte and moving westward through the study period. Sampling on the Pearl River system will be conducted on the same day as the Bay St. Louis sampling.

Lab analyses will be completed within 14 days following receipt by the Analytical Support Branch, or in the case of dioxin by the contract laboratory. The analytical data will then be subject to validation which will add an additional 14 days before the final data package is available to the Project Leader. Interim data reports and the final comprehensive report will be issued according to Table 6.

Table 6
Project Deliverables

Deliverable	Date
In-situ Monitoring Date Report	October 12, 2005
Water Quality Analyses Date Report	November 4, 2005
Bay Outflow Data Report	November 4, 2005
Algal Growth Potential Test (AGPT) Report	November 4, 2005
Sediment Analyses Date Report	November 4, 2005
Comprehensive Report	November 18, 2005

Appendix A
Data Quality Objectives

STEP	DATA QUALITY OBJECTIVES	DESCRIPTION
1	State the problem: • Identify the members of the planning team. • Define the problem • Identify the primary decision maker of the planning team. • Specify the available resources and relevant deadlines for the study.	Planning Team: *Mark Koenig with input from all levels of SESD management. *Drew Bartlett, Chief, Tech. Support & Geographic Planning Branch, EPA, Region 4, WMD *Henry Folmar, Mississippi DEQ *Primary decision makers for the planning team. The problem: Flooding and inundation of municipal and industrial facilities may have resulted in significant inputs of conventional and toxic pollutants to Mississippi coastal rivers and bays. The purpose of this survey is too collect water quality information on a mid-ebb tide at each major bay input to the Mississippi Sound to provide an estimate of pollutant loadings entering Mississippi Sound at the time of the study. In addition, water quality, sediment samples will be collected at historic stations within each bay system at the specific request of MDEQ for its use in comparing conditions resulting from Hurricane Katrina at the time of the study to historic conditions. This study will utilize staff resources from both EPA Region 4 – SESD and MDEQ. Four crews will be used with each crew responsible for a separate aspect of the sampling/monitoring effort. In addition, a command post will be established for receiving and shipping samples and to enhance communications and logistics.

STEP	DATA QUALITY OBJECTIVES	DESCRIPTION
2	Identify the decision • Identify the principal study question. • Define the action that could result from resolution of the principal study question.	The principal question Region 4 has identified is “What is the level of pollutant loading entering Mississippi Sound from major bay systems in Mississippi at the time of the study”. MDEQ has requested that this survey be expanded to answer the question “What is the water quality status of these bay systems at the time of the study versus historic conditions?” The data collected at the outlet of each bay will be used by the EPA to estimate pollutant loadings entering Mississippi Sound. This sampling will provide a “snapshot” of current conditions. It is anticipated that this sampling will be continued on a quarterly basis to determine if pollutant loads are decreasing over time; however, this monitoring will be at the discretion of EPA management in consultation with MDEQ. Data resulting from sampling/monitoring conducted within each bay system will be provided in tabular format to MDEQ for its use in comparing current conditions with historic conditions. Again, the data to be collected is intended only to provide a “snapshot” of current conditions.
3	Identify the inputs to the decision • Identify the information that will be required to resolve the decision statement. • Identify the information that is needed to establish the action level. • Confirm that analytical methods exist to provide the data.	The bay outlet loading study requires measurement of flow on a mid-ebb tide at each bay outlet to the Sound concurrent with water quality sampling and in situ monitoring. The current vs. historic conditions survey requires water quality, and sediment sampling as well as in situ monitoring at each station. Water quality sampling parameters includes: TOC, nutrient series scan, metals scan, routine volatile organic scan, routine semi-volatile scan, pesticide & PCB scan. Sediment sampling includes nutrient series scan, metals scan, routine volatile organic scan, routine semi-volatile scan, pesticide & PCB scan and dioxin. In situ monitoring includes dissolved oxygen, salinity, pH, and temperature. Monitoring will include profiling throughout the water column. The study plan and the <u>Ecological Assessment Standard Operation Procedures and Quality</u>

STEP	DATA QUALITY OBJECTIVES	DESCRIPTION
		Assurance Manual, January 2002 (EASOPQAM) provide more specific details on sampling procedures and study methods.
4	Define Study Boundaries • Specify the characteristics that define the population of interest. • Define the spatial boundary. • Define the temporal boundary. • Define the scale of decision making. • Identify practical constraints on the data collection.	The study area includes 4 major bay areas: Bayou Casotte (including Bangs Lake) Pascagoula/West Pascagoula River system Back Bay of Biloxi Bay St. Louis. In addition, a sampling station has been established near the outlet of the Pearl River on the Louisiana/Mississippi. The study has been requested as soon as possible and will be conducted between September 22 and September 27, 2005 in order to target predicted higher amplitude tides for the Bay outlet loading to Mississippi Sound. Access and bay channel obstructions may significantly limit the ability to collect samples at the designated locations. Every effort will be made to access stations within the limits of personal safety and property damage.
5	Develop a Decision Rule • Specify the statistical parameter that characterizes the population (parameter of interest). • Specify the action level for the study. • Develop a decision rule.	There are no action levels or decision rules currently specified for this study. The study is designed to provide an initial estimate of water quality conditions. Results may be compared to EPA and MDEQ water quality criteria and/or historical data.

STEP	DATA QUALITY OBJECTIVES	DESCRIPTION
6	Specify Decision Error Limits • Determine the possible range of the parameters of interest. • Identify the decision errors and choose the null hypothesis. • Specify a range of possible parameter values where the consequences of decision errors are relatively minor (gray region). • Assign probability limits to points above and below the gray region that reflect the tolerable probability for the occurrence of decision errors.	This study design is appropriate for meeting the objectives outlined in the QAPP and listed in Steps 1 and 2 of this DQO table.
7	Optimize the Design for Obtaining Data • Review the DQO outputs and existing environmental data. • Develop general data collection design alternatives. • Formulate the mathematical expressions needed to solve the design problems for each data collection design alternative. • Select the optimal sample size that satisfies the DQOs for each data collection design alternative. • Select the most resource-effective data collection deign that satisfies all of the DQOs. • Document the operational details and theoretical assumptions of the selected design in the sampling and analysis plan.	Authoritative sampling approach selected to meet study DQOs.

Appendix B

Analytical Tables

Table B1
Nutrients and Classicals Analyte List
Minimum Quantitation Limits by Matrices and Analytical Methods

ANALYTE	Water mg/L (ppm) [1]	Soil/Sed mg/kg (ppm)	Reference Analytical Method
Ammonia	0.05	2.5[2]	780-86-T (Equivalent to EPA 350.1)
Nitrate+Nitrite	0.05	5	EPA 353.2
Phosphorus, Total	0.01	25[3]	EPA 365.1
Kjeldahl Nitrogen	0.05	12.5[3]	786-86T (Equivalent to EPA 351.2)
Total Org. Carbon	1.0	10,000	EPA 415.1-water ASB 107C-soils

MQLs may increase due to variability of interferences that make dilutions of sample necessary. Sample sizes required for achieving the routine quantitation limits listed above:

1 Units as specified unless otherwise noted

2 Calculated using 1.0 grams of sample (dry weight basis, % moisture will increase MQLs).

3 Calculated using 0.2 grams of sample (dry weight basis, % moisture will increase MQLs).

Table B2
Metals Analyte List, Analytical Methods and
Minimum Quantitation Limits by Matrices

ANALYTE	Water Fg/L (ppb) [3]	Saline Water Fg/L (ppb) [3]	Soil/Sed mg/kg (ppm) [1, 3]	Reference Analytical Method
Antimony	2.0	20	2.0	EPA 200.8
Arsenic	2.0	20	1.0	EPA 200.8
Aluminum	500	500	50	EPA 6010B
Barium	10	100	1.0	EPA 6010B
Beryllium	5.0	50	0.5	EPA 6010B
Cadmium	1.0	10	0.5	EPA 200.8
Calcium	500	5000	50	EPA 6010B
Cobalt	10	100	1.0	EPA 6010B
Chromium	10	100	1.0	EPA 6010B
Copper	10	100	1.0	EPA 6010B
Iron	250	2500	25	EPA 6010B
Lead	2.0	20	0.5	EPA 200.8
Magnesium	250	2500	25	EPA 6010B
Manganese	10	100	1.0	EPA 6010B
Mercury	0.2	0.4	0.05	EPA 245.1
Molybdenum	10	100	1.0	EPA 6010B
Nickel	20	200	2.0	EPA 6010B
Potassium	2000	20000	200	EPA 6010B
Selenium	5.0	50	4.0	EPA 200.8
Sodium	2000	20000	200	EPA 6010B
Strontium	10	100	1.0	EPA 6010B
Silver	10	100	1.0	EPA 6010B
Tin	25	250	2.5	EPA 6010B
Titanium	10	100	1.0	EPA 6010B
Thallium	1.0	10	0.5	EPA 200.8
Vanadium	10	100	1.0	EPA 6010B
Yttrium	10	100	1.0	EPA 6010B

Table B2 Metals Analyte List, Analytical Methods and Minimum Quantitation Limits by Matrices				
ANALYTE	**Water Fg/L (ppb) [3]**	**Saline Water Fg/L (ppb) [3]**	**Soil/Sed mg/kg (ppm) [1, 3]**	**Reference Analytical Method**
Zinc	10	100	1.0	EPA 6010B

1 Detection limits are based on 1.0 grams of sample (on dry weight basis, % moisture will increase MQLs).

2 Detection limits are based on 5.0 grams of sample.

3 Units as specified unless otherwise noted

Table B3 Volatile Organics (VOAs) Target Analyte List, Analytical Methods and Minimum Quantitation Limits by Matrices			
	Water[1] Fg/L (ppb)	**Soil/Sed[2] Fg/kg (ppb)**	
ANALYTE	**Routine Level**	**Routine Level (Encore® or Tared Vial)**	**Reference Analytical Method**
acetone	25	25	EPA 8260B
acrylonitrile	NA	NA	EPA 8260B
benzene	1	1	EPA 8260B
bromobenzene	1	1	EPA 8260B
bromochloromethane	1	1	EPA 8260B
bromodichloromethane	1	1	EPA 8260B
bromoform	1	1	EPA 8260B
bromomethane	1	1	EPA 8260B
1,3-butadiene	NA	NA	EPA 8260B
butyl acrylate	NA	NA	EPA 8260B
n-butylbenzene	1	1	EPA 8260B
sec-butylbenzene	1	1	EPA 8260B

Table B3
Volatile Organics (VOAs) Target Analyte List, Analytical Methods and Minimum Quantitation Limits by Matrices

	Water[1] Fg/L (ppb)	Soil/Sed[2] Fg/kg (ppb)	
ANALYTE	**Routine Level**	**Routine Level (Encore® or Tared Vial)**	**Reference Analytical Method**
tert-butylbenzene	1	1	EPA 8260B
carbon tetrachloride	1	1	EPA 8260B
chlorodifluoromethane(R22)	NA	NA	EPA 8260B
carbon disulfide	2.5	1	EPA 8260B
chlorobenzene	1	1	EPA 8260B
chloroethane	1	1	EPA 8260B
chloroform	1	1	EPA 8260B
chloromethane	1	1	EPA 8260B
2-chloro-1,3-butadiene (chloroprene)	NA	NA	EPA 8260B
o-chlorotoluene	1	1	EPA 8260B
p-chlorotoluene	1	1	EPA 8260B
cyclohexane	1	1	EPA 8260B
dibromochloromethane	1	1	EPA 8260B
1,2-dibromo-3-chloropropane	1	1	EPA 8260B
1,2-dibromoethane	1	1	EPA 8260B
dibromomethane	1	1	EPA 8260B
1,2-dichlorobenzene	1	1	EPA 8260B
1,3-dichlorobenzene	1	1	EPA 8260B
1,4-dichlorobenzene	1	1	EPA 8260B
dichlorodifluoromethane(R12)	1	1	EPA 8260B
1,1-dichloroethene	1	1	EPA 8260B
cis-1,2-dichloroethene	1	1	EPA 8260B
trans-1,2-dichloroethene	1	1	EPA 8260B
1,1-dichloroethane	1	1	EPA 8260B
1,2-dichloroethane	1	1	EPA 8260B

Table B3
Volatile Organics (VOAs) Target Analyte List, Analytical Methods and Minimum Quantitation Limits by Matrices

	Water[1] Fg/L (ppb)	Soil/Sed[2] Fg/kg (ppb)	
ANALYTE	**Routine Level**	**Routine Level (Encore® or Tared Vial)**	**Reference Analytical Method**
1,2-dichloropropane	1	1	EPA 8260B
1,3-dichloropropane	1	1	EPA 8260B
2,2-dichloropropane	1	1	EPA 8260B
1,1-dichloropropene	1	1	EPA 8260B
cis-1,3-dichloropropene	1	1	EPA 8260B
dichlorotetrafluoroethane(R114)	NA	NA	EPA 8260B
trans-1,3-dichloropropene	1	5	EPA 8260B
ethyl acrylate	NA	NA	EPA 8260B
ethyl benzene	1	1	EPA 8260B
hexachlorobutadiene	1	1	EPA 8260B
hexane	NA	NA	EPA 8260B
isopropylbenzene	1	1	EPA 8260B
p-isopropyltoluene	1	1	EPA 8260B
methyl acetate	5	1	EPA 8260B
methyl cyclohexane	1	1	EPA 8260B
methyl methacrylate	NA	NA	EPA 8260B
methylene chloride	1	1	EPA 8260B
methyl butyl ketone	2.5	2.5	EPA 8260B
methyl ethyl ketone	12	2.5	EPA 8260B
methyl isobutyl ketone	2.5	2.5	EPA 8260B
methyl-t-butyl ether	1	1	EPA 8260B
n-propylbenzene	1	1	EPA 8260B
1,1,1,2-tetrachloroethane	1	1	EPA 8260B
1,1,2,2-tetrachloroethane	1	1	EPA 8260B
tetrachloroethene	1	1	EPA 8260B
toluene	1	1	EPA 8260B

Table B3 Volatile Organics (VOAs) Target Analyte List, Analytical Methods and Minimum Quantitation Limits by Matrices			
	Water[1] Fg/L (ppb)	Soil/Sed[2] Fg/kg (ppb)	
ANALYTE	**Routine Level**	**Routine Level (Encore® or Tared Vial)**	**Reference Analytical Method**
1,2,3-trichlorobenzene	1	1	EPA 8260B
1,2,4-trichlorobenzene	1	1	EPA 8260B
1,1,1-trichloroethane	1	1	EPA 8260B
1,1,2-trichloroethane	1	1	EPA 8260B
trichloroethene	1	1	EPA 8260B
trichlorofluoromethane(R11)	1	1	EPA 8260B
1,2,3-trichloropropane	1	1	EPA 8260B
trichlorotrifluoroethane(R113)	1	1	EPA 8260B
1,2,4-trimethylbenzene	1	1	EPA 8260B
1,3,5-trimethylbenzene	1	1	EPA 8260B
styrene	1	1	EPA 8260B
o-xylene	1	1	EPA 8260B
(m- and/or p-)xylene	2	2	EPA 8260B
vinyl chloride	1	1	EPA 8260B

MQLs may increase due to variability of interferences that make dilutions of sample necessary. Sample sizes required for achieving the routine quantitation limits listed above:

1 - Water- 5 mL from septum sealed vial.

2 - Routine Level Soil - 5 gram sample preserved with water or acid (dry weight basis, % moisture will increase MQLs).

Table B4 Semivolatile Organics (SemiVOAs) Target Analyte List, Analytical Methods and Minimum Quantitation Limits Guidelines by Matrices			
	Water[1] Fg/L (ppb)	**Soil/Sed[2] Fg/kg (ppb)**	
ANALYTE	**Routine Level**	**Routine Level**	**Reference Analytical Method**
(3- and/or 4-)Methylphenol	10.	330	EPA 8270D
1,1'-biphenyl	10.	330	EPA 8270D
1,2,4-Trichlorobenzene	10.	330	EPA 8270D
2-Nitrophenol	10.	330	EPA 8270D
2-Methyl-4,6-dinitrophenol	20.	670	EPA 8270D
2,3,4,6-Tetrachlorophenol	10	330	EPA 8270D
2,4-Dimethylphenol	10.	330	EPA 8270D
2,4-Dinitrotoluene	10.	330	EPA 8270D
2,4-Dinitrophenol	20.	670	EPA 8270D
2-Methylphenol	10.	330	EPA 8270D
2-Nitroaniline	10.	330	EPA 8270D
2-Chlorophenol	10.	330	EPA 8270D
2-Methylnaphthalene	10.	330	EPA 8270D
2,4,5-Trichlorophenol	10.	330	EPA 8270D
2-Chloronaphthalene	10.	330	EPA 8270D
2,6-Dinitrotoluene	10.	330	EPA 8270D
2,4-Dichlorophenol	10.	330	EPA 8270D
2,4,6-Trichlorophenol	10.	330	EPA 8270D
3,3'-Dichlorobenzidine	10.	330	EPA 8270D
3-Nitroaniline	10.	330	EPA 8270D
4-Chlorophenylphenylether	10.	330	EPA 8270D
4-Chloroaniline	10.	330	EPA 8270D
4-Nitroaniline	10.	330	EPA 8270D
4-Nitrophenol	20.	670	EPA 8270D
4-Chloro-3-methylphenol	10.	330	EPA 8270D
4-Bromophenylphenylether	10.	330	EPA 8270D
Acenaphthene	10.	330	EPA 8270D

Table B4
Semivolatile Organics (SemiVOAs) Target Analyte List, Analytical Methods and Minimum Quantitation Limits Guidelines by Matrices

	Water[1] Fg/L (ppb)	**Soil/Sed[2] Fg/kg (ppb)**	
ANALYTE	**Routine Level**	**Routine Level**	**Reference Analytical Method**
Acenaphthylene	10.	330	EPA 8270D
Acetophenone	10.	330	EPA 8270D
Anthracene	10.	330	EPA 8270D
Atrazine	10.	330	EPA 8270D
Benzo(a)anthracene	10.	330	EPA 8270D
Benzo(a)pyrene	10.	330	EPA 8270D
Benzo(b)fluoranthene	10.	330	EPA 8270D
Benzo(k)fluoranthene	10.	330	EPA 8270D
Benzo(g,h,i)perylene	10.	330	EPA 8270D
Benzaldehyde	10.	330	EPA 8270D
Benzyl Butyl Phthalate	10.	330	EPA 8270D
Bis(2-ethylhexyl)phthalate	10.	330	EPA 8270D
Bis(2-chloroethyl)ether	10.	330	EPA 8270D
Bis(chloroethoxy)methane	10.	330	EPA 8270D
Bis(chloroisopropyl)ether	10.	330	EPA 8270D
Caprolactam	10.	330	EPA 8270D
Carbazole	10.	330	EPA 8270D
Chrysene	10.	330	EPA 8270D
Di-n-butylpthalate	10.	330	EPA 8270D
Di-n-octylphthalate	10.	330	EPA 8270D
Dibenz(a,h)anthracene	10.	330	EPA 8270D
Dibenzofuran	10.	330	EPA 8270D
Diethyl phthalate	10.	330	EPA 8270D
Dimethyl Phthalate	10.	330	EPA 8270D
Fluoranthene	10.	330	EPA 8270D
Fluorene	10.	330	EPA 8270D
Hexachlorobenzene	10.	330	EPA 8270D

Table B4
Semivolatile Organics (SemiVOAs) Target Analyte List, Analytical Methods and Minimum Quantitation Limits Guidelines by Matrices

	Water[1] Fg/L (ppb)	Soil/Sed[2] Fg/kg (ppb)	
ANALYTE	**Routine Level**	**Routine Level**	**Reference Analytical Method**
Hexachlorobutadiene	10.	330	EPA 8270D
Hexachlorocyclopentadiene	10.	330	EPA 8270D
Hexachloroethane	10.	330	EPA 8270D
Indeno(1,2,3,c,d)pyrene	10.	330	EPA 8270D
Isophorone	10.	330	EPA 8270D
N-Nitrosodiphenylamine	10.	330	EPA 8270D
Naphthalene	10.	330	EPA 8270D
Nitrobenzene	10.	330	EPA 8270D
Nitroso-di-N-propylamine	10.	330	EPA 8270D
Pentachlorophenol	20.	670	EPA 8270D
Phenanthrene	10.	330	EPA 8270D
Phenol	10.	330	EPA 8270D
Pyrene	10.	330	EPA 8270D

MQLs may increase due to variability of interferences that make dilutions of sample necessary. Sample sizes required for achieving the routine quantitation limits listed above:

1 - All water - 1000 ml, final extract volume 1 ml.

2 - Routine Level Soil - 30 grams: If the final volume is 1 ml the above limits apply. If split with pesticide, and a final volume of 2 mls, the above detection levels are doubled to 670/1300 Fg/kg (dry weight basis, % moisture will increase MQLs).

Table B5
Pesticide/PCB Target Analyte List
Minimum Quantitation Limits Guidelines by Matrices
Revised 06/26/03

	Water[1] Fg/L (ppb)	**Soil/Sed[2] Fg/kg (ppb)**	
ANALYTE	**Routine Level**	**Routine Level**	**Reference Analytical Method**
Aldrin	0.50	20	EPA 8081A
Heptachlor	0.50	20	EPA 8081A
Hept. Epoxide	0.50	20	EPA 8081A
alpha-BHC	0.50	20	EPA 8081A
beta-BHC	0.50	20	EPA 8081A
gamma-BHC	0.50	20	EPA 8081A
delta-BHC	0.50	20	EPA 8081A
Endosulfan- I	0.50	20	EPA 8081A
Dieldrin	0.50	20	EPA 8081A
p,p’-DDT	0.50	20	EPA 8081A
p,p’-DDE	0.50	20	EPA 8081A
p,p’-DDD	0.50	20	EPA 8081A
Endrin	0.50	20	EPA 8081A
Endosulfan -II	0.50	20	EPA 8081A
Endosulfan- SO4	0.50	20	EPA 8081A
Endrin Ketone	0.50	20	EPA 8081A
Methoxychlor	1.0	50	EPA 8081A
Tech. Chlordane	1.5	50	EPA 8081A
b-chlordene	0.50	20	EPA 8081A
g-chlordane	0.50	20	EPA 8081A
a-chlordane	0.50	20	EPA 8081A
chlordene	0.50	20	EPA 8081A
a-chlordene	0.50	20	EPA 8081A
oxychlordane	0.50	20	EPA 8081A
trans-nonachlor	0.50	20	EPA 8081A
cis-nonachlor	0.50	20	EPA 8081A
PCB(as Aroclors)	2.5	100	EPA 8082

Table B5 Pesticide/PCB Target Analyte List Minimum Quantitation Limits Guidelines by Matrices Revised 06/26/03			
	Water[1] Fg/L (ppb)	**Soil/Sed[2] Fg/kg (ppb)**	
ANALYTE	**Routine Level**	**Routine Level**	**Reference Analytical Method**
Toxaphene	20	1000	EPA 8081A

MQLs may increase due to variability of interferences that make dilutions of sample necessary. Sample sizes required for achieving the routine quantitation limits listed above:

1 - All water - 1000 ml, final extract volume 1 ml.

2 - Routine Level Soil - 30 grams: final extract volume 1 mls (dry weight basis - % moisture will increase MQLs).

Appendix C
Project/Task Organization

Requesting Program:	EPA Region 4 Water Management Division Mississippi Department of Environmental Quality
Responsibilities:	EPA WMD and MDEQ will be end user of the data. Data will be used to assess current water quality conditions and determine pollutant loads to the Mississippi Sound. The WMD will also provide logistic support including securing lodging, ice, and fuel.
Media Contact	Bill Bokey Chief, Ecological Assessment Branch
On-site supervisor	Bill Cosgrove Chief, Ecological Evaluation Section
Project Lead:	Mark Koenig
Responsibilities:	Project lead for field activities/data collection; responsible for collation of all study data report preparation.

Task Leads:

Tidal Flow Measurement:	John Deatrick
Water Quality Sampling:	Laura McGrath
Sediment Sampling:	Morris Flexner
In Situ Monitoring:	Mel Parsons
Sample Handling/Custody:	Phyllis Meyer
Sample Transport	Bill Cosgrove/Bill Bokey

Responsibilities: Task leads are responsible for leading field data collection activities for specific tasks.

APPENDIX D
Field Safety Plan

SAFETY PLAN	
Site Name: Water Quality Study of Bays in Mississippi, Biloxi, MS	Contact::
Address: Motel:	
Phone Number:	
Purpose of Visit: Water, Sediment sampling of the Mississippi outlets to the Gulf of Mexico	
Proposed Date of Work: September 21-28, 2005	
Directions to Site:	

SITE INVESTIGATION TEAM:

PERSONNEL *	SAFETY CATEGORY	RESPONSIBILITIES
Mark Koenig	D	Project Leader
John Deatrick	D	Asst. Project Leader
Phyllis Meyer	B	Safety Officer
Mel Parsons	D	Sampler
Chris Decker	D	Sampler
Bill Cosgrove	D	Sampler
Pete Kalla	D	Sampler
Maggie Pierce	D	Sampler
Laura McGrath	D	QA Officer
Morris Flexner	D	Sampler
Bill Bokey	B	Command Post
Steve Prince	D	Command Post
* All employees have been trained/medically monitored in accordance with OSHA 29 CFR 1910.12 requirements and US-EPA Region IV Field Health and Safety Manual, 1990 edition.		

PLAN PREPARATION:

Site Safety Officer		Date:
Branch Safety Officer	Phyllis Meyer	Date: 9/16/05
Section Chief:	Bill Cosgrove	Date

SITE HAZARDS:

boat travel, unexposed water hazards, biological hazards, heat, cuts

EMERGENCY INFORMATION:

Local Resources:

Ambulance (Name):	Phone:
Hospitals (Name): See attached maps with phone numbers	Phone:
Police (Local or State):	Phone:
Fire Department:	Phone:

Office Resources:

OFFICE/POINT of CONTACT	WORK PHONE	HOME PHONE
EAB Office -Linda Watson	(706) 355-8701	
EPA - Emergency Response - Atlanta	(800) 564-7577	
BTES Section - Bobbi Carter	(706) 355-8708	(706) 795-2075
Ecological Evaluation Section: Bill Cosgrove	(706) 355-8616	(706) 742-7331
Safety - Phyllis Meyer	(706) 355-8709	(706) 549-8533
OHSD - Ron Phelps	(706) 355-8728	
Branch Chief - Bill Bokey	(706) 355-8604	(706) 549-2611

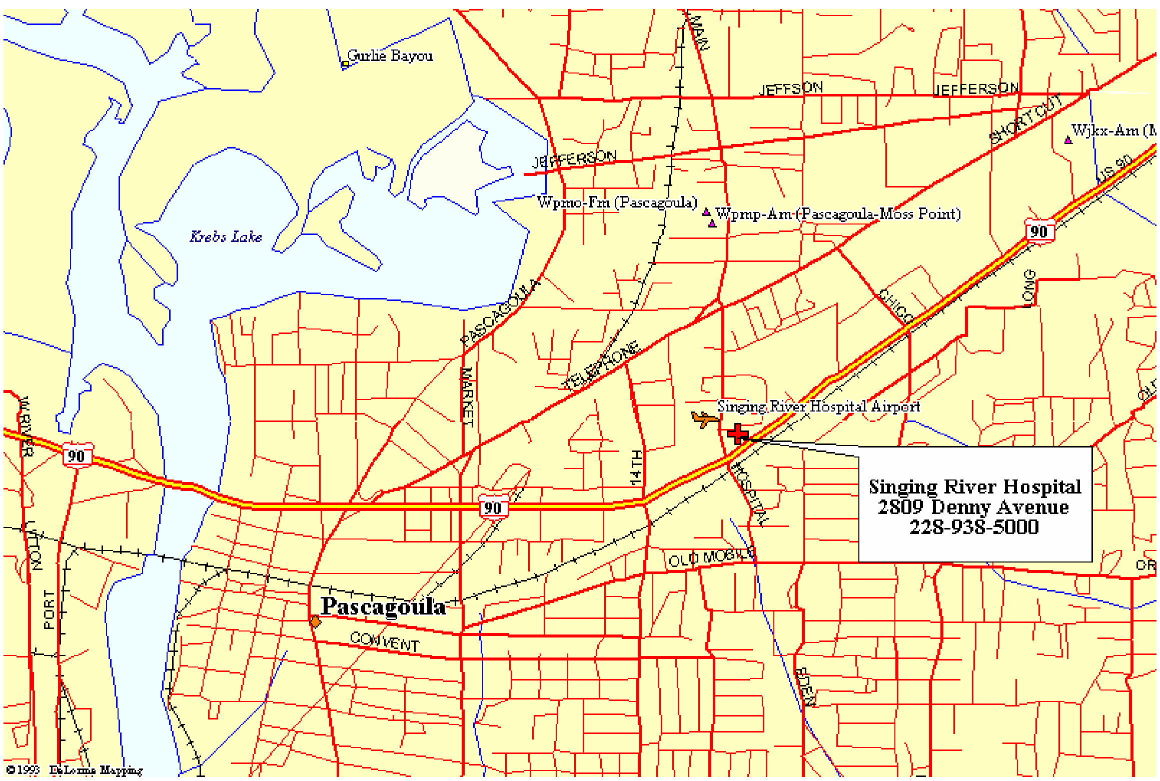
EMERGENCY CONTACTS:

Poison Control Center	Phone: (800) 282-5846
National Response Ctr (ENVIRONMENTAL EMERGENCY ONLY)	Phone: (800) 424-8802

Directions to Hospital : Maps to two different hospitals are attached. Both of these hospitals are up
and running according to Chris Decker. Check the one closest to where you will be working.

<u>Modifications of typical field attire</u>:

Field Dress:	Level D field attire, sunscreen, hat



Goat Island
Little Island
Parkhurst Point
Back Bay Of Biloxi
110
Big Island
Keegan Bayou
Rhodes Point
Auguste Bayou
DIVISION
E DIVISION
<-Reynoir St
Biloxi
HOWARD
W BEACH
90
US 90
Biloxi Regional
150 Reynoir Street
228-432-1571
©1993 DeLorme Mapping

APPENDIX E

Float Plan

Complete this plan, before going boating and leave it with a reliable person who can be depended upon to notify the Coast Guard, or other rescue organization, should you not return as scheduled. Do not file this plan with the Coast Guard.

PROJECT DATES - Sept 21-28, 2005 (if overnight, date returning) -

1. NAME OF PERSON REPORTING:
   TELEPHONE NUMBER:

BOAT MAKE	COLOR	LENGTH	ENGINES	OCCUPANTS
Parker	White	25	2 OB	Mel Parsons, Maggie Pierce, Chris Decker
Parker	White	21	OB	Laura McGrath,, Bill Cosgrove, Pete Howard
Privateer	White	18	OB	Morris Flexner, Pete Kalla, Barb Viskup
Boston Whaler	White	17	OB	Mark Koenig, John Deatrick

4. TRIP EXPECTATIONS: LEAVE AT - 0700 (TIME)
   FROM

Bayou Casotte Ramp 9/22/05
Pascagoula Ramp 9/23/05
Back Bay of Biloxi 9/24/05
St. Louis Bay 9/25/05

GOING TO -
EXPECTED TO RETURN BY: 18:00 each day (TIME)

AND IN NO EVENT LATER THAN: 20:00 (TIME)

5. IF NOT RETURNED BY (TIME), CALL THE COAST GUARD, OR (LOCAL AUTHORITY)
   NAME:
   TELEPHONE NUMBERS:

6. SURVIVAL EQUIPMENT: (CHECK AS APPROPRIATE)

___X__PFDs __X___FLARES _____MIRROR _____SMOKE SIGNALS

_____CLOTHING _____FLASHLIGHT _____FOOD __X___PADDLES

_____WATER _____OTHERS ___X__ANCHOR _____RAFT OR DINGHY

_____EPIRB

7. RADIO:___X__YES _____NO
   TYPE: VHS channel 82 FREQS